Trends in the formation of environmental enforcement international non-governmental organizations, 1950 to 2010

*Paul B. Stretesky* *
Social Sciences and Languages
Northumbria University
paul.stretesky@northumbria.ac.uk

*Michael A. Long*
Social Sciences and Languages
Northumbria University
michael.long@northumbria.ac.uk

*Michael J. Lynch*
Department of Criminology
University of South Florida
mjlynch@usf.edu

Paul B. Stretesky is a professor of criminology at Northumbria University Newcastle. He researches issues related to environmental crime and justice. His recent books include "Exploring Green Criminology," (with M.J. Lynch) and "The Treadmill of Crime: Green Crime and Political Economy"(with M.J. Lynch and M.A. Long).

Michael A. Long is a senior lecturer in social sciences at Northumbria University Newcastle. He is interested in research methods and statistics and researches issues related to fair trade and environmental sustainability. His recent books include "The Treadmill of Crime: Green Crime and Political Economy" (with P.B. Stretesky and M.J. Lynch).

Michael J. Lynch is a professor of criminology and Associate Faculty in the Patel School of Global Sustainability at the University of South Florida. He has been engaged in research related to environmental/green crime since the mid-1980s. His recent books include "Exploring Green Criminology," (with P.B. Stretesky) and "The Treadmill of Crime: Green Crime and Political Economy" (with P.B. Stretesky and M.A. Long).

Words = 7,958 (abstract, paper and references).

Key Words: Crime, INGO, Neoliberalism, International development, density dependence, global culture, civil society

* Corresponding author. Social Sciences and Languages, Northumbria University, Lipman Building, Newcastle upon Tyne, NE1 8ST. Telephone: +44 (0) 191 227 4538.

**Abstract**

Recent research highlights the importance of non-governmental organizations in environmental enforcement. These studies largely describe the operations of enforcement organizations locally. The present study offers an alternative perspective by considering environmental enforcement by international non-governmental organizations (or INGOs). We employ the treadmill of production thesis to investigate the formation of environmental enforcement INGOs between 1950 and 2010. Prais–Winsten estimation techniques are used to investigate whether the formation of environmental enforcement INGOs is correlated with the global ecological footprint, gross world product, and/or organization density. Results confirm that there is no correlation between the ecological footprint and INGO formation. There is, however, considerable evidence of an inverted-U association between density and founding ($p<0.05$). This discovery is important because it provides strong empirical support for the hypothesis that the global environmental enforcement culture is shaped by competitive neoliberal tendencies.

## Introduction

Criminal justice scholars have recently highlighted the relationship between non-governmental organizations (NGOs) and environmental enforcement (Green, Ward, & McConnachie, 2007; Nurse, 2013; van Solinge, 2010; White, 2012). Importantly, the scholarship produced by criminal justicians calls for a better understanding of the impact of environmental enforcement NGOs and the reasons for their formation, with most studies concentrating on the formation, operation and influence of select domestic organizations. International non-governmental organizations (or INGOs) that are focused on environmental enforcement are largely excluded from these criminal justice discussions. The omission of INGOs from the criminal justice literature on environmental enforcement is interesting because environmental crime is often regarded as global in nature (White, 2013). As a result, this study directs attention to the formation of environmental enforcement INGOs (or *EE-INGOs*).

Studying the formation of EE-INGOs allows us to contribute to knowledge in the area of globalization in three important ways. First, determining whether the formation of EE- INGOs is expanding or contracting over time allows us to draw some preliminary conclusions about the global culture of environmental enforcement. That is, if a critical mass of EE-INGOs is developing, there may be significant opportunities for these organizations to pool their resources to advance common environmental interests and jointly tackle global environmental crime.[1] Second, determining whether potential patterns in EE-INGO formation are correlated with global indicators of economic growth and/or environmental degradation provides insight into the

[1] The optimistic assumption is that EE-INGOs will come together to leverage their resources as they expand. This is, of course, an empirical question. That is, there may be opportunities for EE-INGOs to increase their collective influence on common environmental issues as they expand. However, it may also be the case that EE-INGOs are less effective as they expand because they compete for scarce resources.

underlying conditions that give rise to this area of global polity. That is, empirical analyses can help determine whether, on aggregate, these organizations are more strongly associated with economic opportunities or to threats to global environmental sustainability. Third, scholars of non-profit globalization have suggested that NGOs are increasingly subject to neoliberal market-based approaches that demand that they compete for financial donors and government contracts in an era of 'venture philanthropy' (Eikenberry & Kluver, 2004; Frumkin, 2003; Wallace, 2009). Thus, studying formation trends in relation to the number of existing organizations allows us to assess whether INGOs may be subject to neoliberal constraints as the formation of these organizations may be limited by their own growth (Cooley & Ron, 2002; Carroll & Hannan, 2000).

We begin by exploring the basic role of INGOs in global culture. That discussion provides the backdrop to our theoretical arguments that draw upon the treadmill of production thesis to explain why EE-INGOs may form. This literature suggests that environmental organizations find it hard to advocate for environmental sustainability because they are born and defined by global forces of capitalism (Schnaiberg, 1980). Finally, we examine EE-INGO formation at the global level by looking at the patterns of formation relative to patterns of environmental degradation, global economic growth and organizational competition.

**Background**

The expression 'non-governmental organization' (NGO) is tied to Article 71 (Chapter 10) of the United Nations Charter of 1945, which notes, 'The Economic and Social Council may make suitable arrangements for consultation with non-governmental organizations which are concerned with matters within its competence.' Today the term 'non-governmental organization' is common, and is used to describe one important set of organizational actors that are part of a

global culture. Nevertheless, the application of NGO as a label is contested, for example, when organizations are defined according to values. As a result, there are often significant disagreements about the definition of NGOs based on the issues they address and the strategies they use. Despite these disagreements, however, researchers such as Willetts (2010) suggest that there is some consensus among scholars concerning the general definition of NGOs. Specifically, Willetts (2010, p.31) states that an NGO is 'any organized group of people that are not direct agents of individual governments, not pursuing criminal activities, not engaged in violent activities, and not primarily established for profit-making purposes.' This definition makes it possible to empirically study NGOs, but it is still difficult to determine how many exist. Fortunately, at the international scale of analysis, organizations such as the Union of International Associations (UIA) monitor NGOs to facilitate better international cooperation among various global actors. In its *Yearbook of International Organizations*, the UIA has kept track of these organizations for nearly a century, and their documents suggest that INGOs have existed in some form since at least the mid-1800s (Boli & Thomas, 1997).

From a globalization perspective, INGOs are important indicators and outcomes of global culture. First, INGOs bridge the gap between public and private institutions in a way that helps to define culture (Teegen, 2003). They may not be able to directly create or make laws, but, as Bennett (2012, p. 801) observes, they may have sufficient power 'to push around the largest governments and rival corporate adversaries.' As agents of global culture, then, INGOs can influence global norms when participating in governance and politics through consultation with IGOs, states and corporations. Moreover, INGOs can bring legal cases forward to various international bodies and also engage in global communication efforts using global media such as the internet to draw attention to problematic social issues (Willetts, 2010).

Second, global culture, particularly global neoliberalism, may influence how INGOs emerge and operate (Wallace, 2009). It is the formation of INGOs that interests us. Indeed, these organizations may easily be viewed as manifestations of globalization that reflect an intensified neoliberal polity (Carroll & Jarvis, 2015). Importantly, we suggest that INGO formation follows materialist patterns of production and competition and thus is more likely to be influenced by economic conditions than by the need to respond to alarming environmental harms.

Studies suggest rapid growth in the number of INGOs in recent years (Bennett, 2012). Boli and Thomas (1997) examined INGO expansion by following trends in INGOs listed in the *Yearbook of International Organizations*. They found that the number of active INGOs increased from 200 in 1900, to 800 by 1930, to more than 2,000 by 1960, and to nearly 4,000 in 1980. While the number of INGOs has increased, the focus of the INGO sector has also changed. Importantly, environmental INGOs have become more visible (Schofer & Hironaka, 2005). Murdie and Davis (2012, p. 180) recently found that 1,019 of the 4,378 INGOs they studied were focused on environmental concerns. As Conrad and Hilchey (2011, p. 273) make clear, '[w]orldwide, decision-makers and non-governmental organizations are increasing their use of citizen volunteers to enhance their ability to monitor and manage natural resources, track species at risk, and conserve protected areas.'

Here, we are interested in a small subset of environmental organizations that focus directly on enforcement (i.e., EE-INGOs). These environmental enforcement organizations often use employees to advocate for the creation of more stringent environmental regulations and criminal statutes as well as better crime monitoring, implementation and enforcement of laws and regulations currently on the books. Drawing on economic arguments, we seek to determine whether global indicators of income and completion are correlated with the formation of

environmental enforcement INGOs. In doing so, we address two questions. First, are EE-INGOs forming as a consequence of the disturbing trend in unsustainable consumption of the earth's natural resources (McCormick, 1991)? Or, second, does organizational formation reflect general trends in worldwide economic growth (Waterman, 1998)? Significantly, as noted above, the more critical NGO literature suggests that INGOs may be limited by neoliberal tendencies as they are forced to compete for scarce resources to support their existence.

**The Formation of Environmental Enforcement INGOs**

We draw upon the treadmill of production (ToP) thesis to contextualize our empirical examination of the formation of EE-INGOs (Schnaiberg, 1980). Specifically, the ToP argument emphasizes that ecological degradation takes place as a result of a global capitalist system that constantly accelerates economic growth and consequently increases natural resource withdrawals and pollution (Schnaiberg, 1980). The treadmill thesis demonstrates that corporations and the state have an incentive to pursue economic growth (i.e., treadmill policies) despite environmental costs (Gould, Pellow, & Schnaiberg, 2008). Within the treadmill thesis, however, there is potential for citizen workers to intervene by pressuring the state to place constraints on production (Gould, Schnaiberg, & Weinberg, 1996; Stretesky, Long & Lynch, 2014), which may influence the growth of EE-INGOs and their participation in state policy-making, lobbying efforts to change laws, and actions such as filing court cases against potential violators (Crack, 2013). These actions expand the net of state control over environmental crime and its definition. In short, there is reason to believe that citizen activism may promote the expansion of EE-INGOs.

However, the treadmill thesis also suggests that, in the aggregate, formal organizations such as environmental INGOs have yet to do much to stop the acceleration of environmental

degradation (Gould, Schnaiberg, & Weinberg, 1996).[2] As treadmill theorists note, the environmental movement has been unable to pressure the state to change policies because it is constrained by capitalist hegemony associated with funding sources and ideology produced within a global capitalist system (Gould, Pellow, & Schnaiberg, 2008). Specifically, organizations such as EE-INGOs are shaped by global economics and compete with one another for resources in a neoliberal non-governmental market.

It is within this treadmill perspective of optimism and despair that we examine the formation of EE-INGOs as a reflection of global culture and economy to determine what conditions may give rise to their formation. To do so we examine trends in the formation of environmental enforcement INGOs in the context of ecological impact, global production and the INGO marketplace. We examine each concept in turn.

***Ecological Impact.*** Foster, Clark and York (2011) suggest that capital accumulation relies on accelerated production and therefore creates a condition that is unsustainable and threatens the biosphere. Within the global economic framework the enhanced pace of production influences the rate of natural resource withdrawals as producers expand the withdrawal of natural resources to manufacture commodities. This 'treadmill' has environmental consequences because it increases and intensifies extraction through, for example, mining, drilling and harvesting (Schnaiberg, 1980). The social and ecological damage caused by extraction techniques is extensively documented in case studies and empirical research in several disciplines (e.g., Aigbedion & Iyayi, 2007; Bell & York, 2010; Clark, Jorgenson, & Auberach, 2012; Elberling et al., 2007; Green, Ward, & McConnachie, 2007; Jorgenson, 2006, 2003;

[2] INGOs represent the more formal portion of the global environmental movement. Many INGOs have well-defined hierarchical authority structures, written policies and procedures and established communications channels. These organizations also rely on financial resources to hire and reward employees, including administrative staff, who follow established job descriptions in order to further INGO goals and objectives (Udy, 1959).

Jorgenson & Clark, 2011; van Solinge, 2008, 2010). Importantly, withdrawals that are used in production are closely related to levels of pollution (or ecological additions) because waste is released into the environment during the production process. Some of this waste has significant consequences for the biosphere as it drives us closer to planetary boundaries that, if crossed, may signal an end to life on earth as we know it (Rockström & Klum, 2015).

One way that the ecological impact of humans on the earth can be measured is through the concept of the 'ecological footprint' (Wackernagel & Rees, 1998). The footprint is measured by determining the amount of land area it takes to support the extraction of natural resources and absorb the waste created in production. The ecological footprint suggests that we consume approximately 1.6 earths to support present levels of global production. Because there is no such thing as 1.6 earths, we exceed what the earth can sustainably produce and use up nature's capital (i.e., the stock of the earth that produces raw materials). Thus, data on the ecological footprint demonstrate that humans are using natural resources and polluting the environment at a greater rate than the earth can process. The footprint provides a global indicator of environmental degradation over time and reflects the material conditions of the environment, which may generate grievances that drive organizing efforts that may be framed within an environmental crime and deviance perspective (McAdam, McCarthy, & Zald, 2008).

We draw on the optimistic portions of the treadmill thesis to hypothesize that as the global challenge to sustainability intensifies, more EE-INGOs will form to combat the perceived problem of environmental crime driven by neoliberal economic policies that threaten ecological sustainability (Gould, Pellow, & Schnaiberg, 2008; see also Parvu, 2016). In this view, relative ecological deprivation should encourage the formation of EE-INGOs because perceptions about

the importance of ecological sustainability diverge from reality.[3] Importantly, data reflecting ecological threats may create the background factors that give rise to the formation of EE-INGOs as part of a larger environmental social movement and global culture (McAdam, McCarthy, & Zald, 2008; Meyer et al., 1997). As a result, our first hypothesis suggests that *the consumption of the earth's resources is positively associated with the formation of environmental enforcement INGOs over time*. Thus, when the ecological footprint increases, a greater number of EE-INGOs will form to combat this trend.

***World Production.*** A global political economy of production suggests that workers and the state have an interest in accelerating production to support capitalist accumulation tendencies (Schnaiberg, 1980; see also Marx, 1977 [1867]). Technology can aid in capital accumulation.[4] Workers may support technological change that threatens the environment because they are promised that they may keep their jobs if they become more efficient (Bell & York, 2010). States support production because it generates revenue that can be used for social services (Gould, Pellow, & Schnaiberg, 2008). Opposition to production practices may come from the environmental movement and its organizations. However, at least a portion of the wealth needed to support the salaries of INGOs (their workers and campaigns) must come from private philanthropists who have derived their donations from capitalism itself (Ruggiero, 2013). As a result, the increase in global world production may set the stage for environmental enforcement INGOs to form because of that wealth. For instance, production-related income is likely a

[3] We define relative ecological deprivation as the difference between citizen workers' (see Gould, Schnaiberg, & Weinberg, 1996) perceptions and expectations of the performance of global environmental governance policies. When performance expectations are well below perceptions about actual performance then there is a significant level of ecological deprivation.

[4] Marx (1977 [1867], p. 492) suggests that 'like every other instrument for increasing the productivity of labour, machinery is intended to cheapen commodities and, by shortening the part of the working day in which the worker works for himself, to lengthen the other part, the part he gives to the capitalist for nothing.'

necessary component for the formation of INGOs. Thus, in an era of venture philanthropy it is likely that production is at least indirectly responsible for the financial support of EE-INGOs. One way to measure production-related income is with gross world product (GWP), which measures the total size of the world economy as the combined gross national product of all countries in the world. Our second hypothesis examines the more cynical nature of the treadmill thesis and suggests that *overall levels of production-based wealth are positively associated with the formation of environmental enforcement INGOs over time*. Such a finding would lead us to question whether a global environmental enforcement culture could ever effectively challenge treadmill policies.

***Neoliberal Enforcement Culture.*** Neoliberalism describes the tendency to transfer what are typically considered public services to the private sector. Global environmental enforcement is one such area where neoliberal policies may be especially relevant. EE-INGOs are arguably taking over state functions on a global level. This is especially true as INGOs are deeply reliant on private funding (Crack, 2013; Wallace, 2009). For example, Crack (2013, p. 297) observes that 'the motivations of the INGO are instrumental and reactive: they seek to appease governments and donors. . . . This is short-sighted and, at worst, self-defeating.' As a result, the treadmill perspective challenges the notion that non-local organizations such as INGOs will oppose treadmill tendencies because they are beholden to market competition and private funding sources that serve elite policy interests (Pellow & Brulle, 2005; Ruggiero, 2013; Gould, Schnaiberg, & Weinberg, 1996; see also Harvey, 2005). A reliance on competition for elite funding may therefore serve to spread the philosophies and strategies that ultimately serve to support the global treadmill agenda. Thus, INGOs may behave in a way that is consistent with private capital. The concept of *density dependence* can be situated within a treadmill framework

to examine the tendency for potential competition in the civil sector. We therefore draw upon the density dependence thesis (Hannan & Freeman, 1977) to supplement observations by non-profit scholars that the NGO market is increasingly subject to neoliberal development in an era of venture philanthropy.

The theory of density dependence emphasizes neoliberal notions of markets and income. According to Carroll and Hannan (2000), density dependence can best be described in two stages. In the first stage a few existing organizations promote the development of other similar organizations by providing ideological space that legitimates their existence. In mathematical terms, adding an organization to an organizational sector increases the legitimacy of the sector, and so the probability that subsequent organizations will develop increases. In the second stage of density dependence theory this relationship changes because there are too many organizations in the sector and they begin to compete for resources and people. As a result, in this stage the probability that a new organization will develop in this global market decreases as each additional organization is added to the sector. Empirical research suggests that an inverted-U pattern exists when examining the association between density and founding among samples of non-profit organizations (Minkoff, 1997; Nownes, 2010; Stretesky, Huss, & Lynch, 2012).

The extension of density dependence theory leads us to question whether neoliberal policies drive the formation of environmental enforcement INGOs. To examine whether existing environmental enforcement organizations may limit future sector development (i.e., whether an international organizational 'ceiling' has developed), we rely on density dependence theory to create two testable hypotheses. Thus, the third hypothesis suggests that *during the early stages of INGO formation there is a positive correlation between organization density (i.e., the number of existing organizations) and the number of environmental enforcement INGOs founded as*

*investors rush to donate to a new emerging INGO sector*. Once competition for resources is established, however, we suggest a fourth hypothesis: that *there is a negative correlation between organizational density and the number of environmental enforcement INGOs founded*. Taken together, these two hypotheses can be modeled in non-linear terms through a quadratic term in regression.[5] Importantly, if the quadratic term is statistically significant and inversely associates with the formation of INGOs, then evidence suggests that these particular actors in the global culture are limited by neoliberalism and cannot produce the critical mass needed to contribute to global environmental change.

**Data and Methods**

We analyze environmental enforcement INGO founding as a function of ecological footprints, global world income and organization density annually for the years 1950 to 2010 ($n$=61). Because this is a time series analysis, we correct for problems of serial correlation in these data as noted below. The data used to construct the dependent variable 'founding' and independent variable 'density' come from three primary sources that list international organizations: (1) the *Encyclopedia of International Organizations* (Gale Research Group, 1997–2010), (2) the *Yearbook of International Organizations* (Union of International Associations, 2001–2010) and (3) the *World Directory of Environmental Organizations* (International Union for Conservation of Nature and Natural Resources, 1992, 1996, 2001). We selected these sources in order to compile a list of potential EE-INGOs that formed between 1950 and 2010. The *Encyclopedia of International Organizations* includes over 30,000 national and multinational organizations from around the world and is structured according to broad categories that describe

[5] This effect can be modeled in ordinary least squares regression as: $y_t = \alpha + \beta_1 x_t - \beta_2 x_t^2 + e$. This equation estimates the number of organizations founded in time ($y_t$) by calculating the partial slope coefficients for $\beta_1$ and $\beta_2$ given the number of existing organizations ($x_t$), correcting for any omitted variables and error in measurement ($e$).

the sectors in which the organizations operate. Encyclopedia entries contain important information such as mission statements, the countries in which the organizations are headquartered, and the year in which the organizations were established. The *Yearbook of International Organizations* lists nearly 66,000 international organizations and also contains information on those organizations, including the year in which they were founded and their missions. Finally, the *Directory of Environmental Organizations* provides information on environmental non-governmental organizations around the world and also includes mission statements and establishment dates.

Each data source (*Encyclopedia*, *Directory* and *Yearbook*) has widely recognized limitations, and we acknowledge that even when these directories are considered together, they do not capture the full range of global environmental enforcement organizations since some organizations may have been founded and then disbanded before they were captured in any database or directory. Moreover, under-represented INGOs that do not appear in these directories are likely to be more radical, less formalized and short-lived. Still, there is also considerable overlap in data sources and organizations that do show up in these directories.[6] As a result, we recognize the listings of organizations are not perfect, but that they likely are an adequate reflection of trends in the global culture of environmental enforcement.

To determine which of these organizations could be classified as environmental enforcement INGOs we first identified all organizations that fell under 'environment,' 'conservation,' and 'natural resources.' Each organization's mission statement in each of these categories was examined by two researchers to see if the organization could be classified as an

[6] We are not the first to use these particular data sources to answer questions about INGOs. For instance, Longhofer and Schofer (2010) draw upon both the *Encyclopedia* and the *Directory* to examine the founding of environmental organizations across countries, and Boli and Thomas (1997) draw upon the *Yearbook* to look at the growth of INGOs.

environmental enforcement INGO. A total of 263 EE-INGOs were selected using this coding process. Inter-coder agreement was 95%. Thus, despite the relatively subjective nature of the enforcement definitions and coding procedure, there was high agreement about which organizations engaged in some type of environmental enforcement.

For the purposes of this research we defined an organization as an EE-INGO if it described itself as engaging in traditional enforcement operations or claimed to focus on changing laws or enforcement practices by influencing state actors.[7,8] When counting INGOs we did not include governmental organizations (such as state environmental enforcement agencies) and only counted multi-country listings one time according to the INGO's headquarters location and description, since the same organization often appeared in multiple directories for multiple years. Thus, local chapters of organizations (such as Greenpeace) were not counted when the Greenpeace headquarters organization was counted. This prevented the double counting of organizations that had local operations in multiple countries.

***Dependent Variable***

The dependent variable in this study represents the annual number of EE-INGOs founded. For each year ($n$=61) in the dataset we count the number of EE-INGOs formed in that

[7] The definition of INGOs is contested, and some organizations that are INGOs may be included or excluded despite satisfying the definition of an INGO. We examine the Sea Shepherd Conservation Society as a test case (www.seashepherd.org/who-we-are). James F. Jarboe of the Federal Bureau of Investigation (2002) suggests that this organization is engaged in 'eco-terrorist' activities. However, Sea Shepherd reports on its website that it seeks to 'expose and confront illegal activities on the high seas.' Despite these varied descriptions of this particular INGO it is listed in the *Yearbook of International Organizations* as an INGO founded in 1977 (see http://www.uia.org/s/or/en/1100051655) and is therefore included in our sample. But the extent to which our findings reflect the contested nature of INGOs is open to debate (Willetts 2010).

[8] We identify operations INGOs as those organizations that carry out international, national, state, or local legal actions (civil or criminal) to enforce environmental laws, rules, regulations or agreements and/or obtain penalties or criminal sanctions for violations. This includes monitoring efforts. INGOs may also provide direct aid (in the form of resources or monitoring for environmental violations) to state or other governmental agencies that carry out environmental protection efforts.' We define advocacy and lobbying organizations as those that lobby governments (international, national, state or local) for the creation of environmental laws, rules, regulations or agreements and/or the enforcement of environmental laws, rules, regulations or agreements.

particular year. As noted, EE-INGO founding dates were obtained from information reported in organizational directories. To obtain the total number of organizations formed in any particular year, we simply counted the number of organizations that reported forming in that particular year for the 263 organizations included in our sample. These founding rates are presented in Figure 1.

[Figure 1 About Here]

As Figure 1 demonstrates, EE-INGOs did not develop evenly between the years of 1950 and 2010. While several organizations existed prior to 1950, the founding of organizations between the years of 1950 and 1960 was sporadic. It was not until the early 1960s that EE-INGO founding increased; it then peaked in 1990 and then declined until 2010. Overall, an average of 3.9 organizations were founded each year between the years of 1950 and 2010.

***Independent Variables***

***Ecological Footprint.*** The independent variable measuring ecological impact is derived from the Global Footprint Network (www.footprintnetwork.org). The footprint is 'a measure of how much area of biologically productive land and water an individual, population or activity requires to produce all the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices' (http://www.footprintnetwork.org/en/index.php/GFN/page/glossary/). For the purposes of this study, the footprint is expressed globally as the number of earths needed to keep global production sustainable. This statistic represents global consumption and waste absorption divided by the earth's biocapacity in any given year. When total consumption and waste exceed biocapacity, the statistic is greater than 1. When biocapacity exceeds consumption, the statistic is less than 1. Data on the footprint are available from 1961 to 2010 (n=49) and suggest that the world is putting more stress on the biosphere today than it did in the past. Overall, the mean

footprint between 1961 and 2010 is 1.19 (std. dev. = 0.19), indicating that global consumption and related waste absorption practices greatly exceed what can be produced sustainably. We expect that the larger the ecological footprint becomes, the greater the number of environmental enforcement INGOs will form in any given year as a response to perceived unsustainable production practices. These organizations would then serve as a counterforce to production.

***Gross World Product.*** World production is measured using the gross world product (GWP) as obtained from the Earth Policy Institute Data Center (http://www.earth-policy.org/data_center/). The gross world product is the combined gross national product of all countries. The statistic is standardized in 2010 US dollars and uses purchasing power parity (PPP) to make comparisons of relative value across countries. In this study, GWP is expressed in trilliions of US dollars. Between 1950 and 2010 the average GWP was $30.9 trillion (std. dev. = 19.26). We suggest that when production-generated income increases, environmental enforcement INGO formation will also increase, since organizations require resources to operate. These resources are more likely to be forthcoming when generated income is high, setting the stage for venture philanthropy on a global level.

***Organization Density.*** The neoliberal enforcement culture is measured through EE-INGO organization density and organization density squared. As noted, density is likely to encourage the formation of new organizations as the cultural market for those new organizations emerges. However, when a significant number of organizations form they are likely to compete for resources in a neoliberal marketplace. Therefore, as the density of organizations increases, the formation of environmental enforcement INGOs should decrease since organizations are in competition for resources. To measure organization density we record the total number of environmental enforcement organizations that exist in any particular year. We limit the count of

organizations to those in the same sector (i.e., environmental enforcement INGOs) to maximize legitimating and competing effects. As might be expected, INGO density increases over time as more organizations are formed. The mean number of EE-INGOs in any given year between 1950 and 2010 is 123 (std. dev. = 89.4). According to density dependence theory we should observe a positive and then a negative association between environmental enforcement INGO density and environmental enforcement INGO formation.

To model the potential for these organizations to be positively and then negatively related to environmental enforcement INGO formation we include an independent variable that measures density squared. Thus, if the coefficient of organization density is positive and the coefficient for density squared is negative then there is some evidence that organization density is positively, then negatively, related to the formation of environmental enforcement INGOs.

***Controls*.** This research examines three global indicators that we believe are theoretically important and correlated with the formation of EE-INGOs over time. To be sure, there are many reasons for the formation of INGOs, and some, undoubtedly, cannot be captured in an aggregate global model of INGO formation. To help correct this bias and provide a better test of the ecological footprint, global production and the neoliberal INGO marketplace, we consider four control variables that may signal alternative explanations of EE-INGO formation. These controls are sometimes noted to be correlated with general rates of INGO founding (e.g., Boli & Thomas, 1997; Willetts, 2010) and can be obtained from the World Bank's World Development Indicators database (http://data.worldbank.org/). First we consider the potential importance of mobile phones. We measure this using the number of mobile telephone subscriptions to a public mobile telephone service per 100 people. Cell phone data are available starting in 1980 and may

contribute to communication networks that foster the formation of environmental enforcement INGOs.

Second, we consider the potential role of exports of goods and services. That is, INGOs are probably more likely to form when interdependence is high. Exports of goods represent the value of all merchandise and other market services such as financial, business and government that one country provides to another as a percentage of the GWP. These data are available starting in 1960.

Third, we control for the percentage of the world population living in an urban location. Urbanization may be important in creating the conditions for INGOs to form since nearly all are headquartered in urban areas.

Finally, we control for education, since education may provide an indicator of necessary human capital for the formation of organizations. Education is measured as the percentage of the global population classified as students. That is, we control for the percentage of the global population enrolled in public and private primary and secondary education institutions, regardless of their age.

**Analysis**

Time series methods (regression analysis) are used to analyze the association between ecological footprint, GWP, organization density, density squared and INGO founding for the years 1950 to 2010. One potential problem with time series data is the presence of nonstationarity, a condition that can be identified when distributions change over time. Nonstationarity may produce artificially high correlations when variables trend together. Because founding steadily increases between 1950 and 1990, and because organization density, ecological footprint and gross world product generally increase during the same time period, we

'de-trend' the data by differencing the dependent and independent variables prior to estimating partial slope coefficients. In the case of founding, for example, we subtract the number of environmental enforcement INGO foundings in year *t* from the number of INGO foundings in year *t*-1. Results in Table 1 suggest that the change variables are stationary and unproblematic for time series analysis.

Even after de-trending these data, autocorrelation is a potential problem with them. Because Models 1 to 4 suggest potential autocorrelation without additional corrections (*Durban-Watson* = 2.50 [Model 1] to 2.85 [Model 4]), we correct for this problem using Prais–Winsten regression. Results of that correction are presented in Table 1 and suggest that autocorrelation is no longer a problem since all Durban-Watson statistics are close to the ideal value of 2.0 that indicates no statistical correlation (i.e., *Durban-Watson* = 2.01 to 2.13). Importantly, the residuals in each of the models appear normally distributed, and multicollinearity does not appear to be a problem (i.e., Variance Inflation Factor [VIF] scores in Table 1 do not exceed 5, except as might be expected in Model 5 when all variables of interest and controls are included in the model and the range of years is restricted to 1970 to 2010).

[Table 1 About Here]

We begin by examining ecological footprint, GWP and density separately and together in Table 1 (Models 1 to 4). This analysis suggests that there is no correlation between the ecological footprint (1961 to 2010), gross world product and INGO founding. That is, there appears to be little evidence that ecological degradation influences global environmental enforcement culture. As previously noted, this finding may not be surprising as INGO formation may be the result of many factors that are unrelated to environmental conditions. Moreover, it

may be the case that perceptions about ecological degradation are more important than degradation itself.

Model 2 (Table 1) suggests that income is also uncorrelated with INGO formation. That is, the global culture of environmental enforcement does not appear to be a function of production-related income when examined in isolation. Models 3, 4 and 5 suggest that organization density is positively associated with founding ($b$ = 0.61; 0.90; 1.08), while density squared is negatively associated with founding ($b$ = –0.001; –0.002; –0.002) in Model 3. Together these variables suggest an inverted-U-shaped association between density and founding, indicating that environmental enforcement culture develops in a neoliberal atmosphere. Thus, while global EE-INGOs may have initially attracted venture capital to help in their formation, it appears that a competitive, neoliberal culture eventually emerged as a negative correlation between density and founding developed. That is, within the global market, existing EE-INGOs appear to decrease the probability that an additional EE-INGO will form. Thus, there is support for the density dependence hypotheses (hypotheses three and four) and for the notion that the population of environmental enforcement organizations is in fact constrained by a neoliberal global culture.

Model 4 (Table 1) allows for the simultaneous examination of *Ecological Footprint*, *Gross World Product* and *Density* on *Founding*. That model largely replicates Models 1 to 3, as ecological footprint is not a statistically significant predictor of founding while density and density squared remain important predictors. One important exception in Model 4 is the association between *GWP* and *Founding*, which is statistically significant and adds considerable explanatory power to the models—suggesting that income may be important in the determination of EE-INGO founding when density is controlled. Importantly, a $1 billion annual increase in

GWP is associated with an increase of 1.174 additional EE-INGOs. As a result, Model 4 suggests that while ecological footprint matters little in the formation of EE-INGOs, the growing number of existing INGOs may limit founding, while rising global income increases founding. In other words, income may matter more than ecology in producing EE-INGOs. The fact that income is related to the formation of EE-INGOs provides some support for our second hypothesis. However, this association again disappears in Model 5 (Table 1) when controls are included in the analysis. Nevertheless, if this correlation is reflective of an actual relationship between income and founding, we ask whether a global environmental enforcement culture that emerges from production-related income will effectively challenge those conditions that produced it.

**Discussion and Conclusions**

Criminal justice scholars suggest that environmental enforcement NGOs are important actors that deserve additional study. We have contributed to the knowledge in this area by examining how these organizations may reflect global culture and why they may have formed. Drawing upon arguments presented in the treadmill of production thesis we suggest that environmental enforcement INGOs may face significant challenges that serve to produce a global neoliberal culture of environmental enforcement. This culture, we argue, could be unable to address important forms of environmental crime and deviance across the globe.

First, we discover that the ecological footprint is not correlated with EE-INGO formation and therefore appears to have little to do with the emergence of a global environmental culture. The lack of an association between the ecological footprint and EE-INGOs over time is interesting because it suggests that a global environmental enforcement culture is not developing out of need (even if a need exists). Moreover, we might question whether such actors could

challenge the treadmill of production if it does not respond to material conditions in the ecology.

Second, there is some evidence suggesting that global production-related income or GWP is correlated with the formation of EE-INGOs. Admittedly, this association is only significant in one of the three models estimated. However, the existence of the correlation in one of the models does cause us to question whether a global milieu of production shapes a global environmental enforcement culture. If so, this has profound implications for environmental crime, law and justice across the globe. For instance, Gould, Schnaiberg and Weinberg (1996) note that trends in economic production may actually empower transnational corporations at the expense of the environmental movement. How this happens, however, is open to future examination. We believe that criminal justice scholars who study the relationship between the political economy and crime are well positioned to examine the potential relationship between production and private enforcement institutions in greater detail because it is precisely the influence of capital accumulation that they often claim influences the number and form of criminal laws (Lynch, Michalowski, & Groves, 2000; Reiman & Leighton, 2015).

Finally, we discover a correlation that appears to suggest that INGOs operate in a neoliberal market. That is, the initial correlation between density and formation is positive, as we predicted based on competitive models of for-profit institutions. However, that association changes over time and INGOs appear to begin to operate competitively, in a neoliberal fashion. In other words, over time the association between density and formation becomes negative. As a result, these correlations suggest that EE-INGOs may follow the traditional density dependence model of growth that signals private market competition. This is the exact correlation we might expect to observe in a global culture of venture philanthropy. Thus, even if EE-INGOs are not constrained by a culture of production that gives rise to those organizations, there are,

nevertheless, limits to the numbers of formalized INGOs that can emerge to challenge producers and encourage the state to take environmental enforcement actions. Thus, the very nature of INGOs within the world political economy will likely limit their intensification and therefore the impact they may have on world polity. This leaves states to increasingly follow treadmill tendencies by facilitating the expansion of the treadmill of production at a global level. Such a finding is, again, consistent with the treadmill of production thesis that proposes that these more formalized organizations may not be effective.

While the current analysis lends significant empirical evidence to the study of global environmental enforcement culture, there are limitations to this study. Importantly, the organizations we examined are formalized and exclude the informal actors that do not appear in directories and encyclopedias. While informal organizations (e.g., most local grassroots citizen worker groups) are probably in the best position to challenge the treadmill of production, large formalized organizations are probably in the worst. Smaller grassroots organizations may be more likely to successfully pressure their own governments to better enforce environmental laws and change policy.

This study drives home the dynamic of a global environmental enforcement culture by highlighting the importance of empirical analysis in the study of INGOs as organizations that reflect global culture. Still, there is much to be done. While the present analysis adds to the emerging research on environmental enforcement INGOs, it only addresses half the puzzle. That is, we examine the factors that shape the global environmental enforcement culture, but we believe our discussion also raises important concerns about the way these organizations may influence the formation of environmental enforcement legislation as well as international environmental laws. Specifically, we suggest that future research look at the potential impact that

environmental enforcement INGOs can have on the culture of global environmental enforcement.

**References**

Aigbedion, I., & Iyayi, S. E. (2007). Environmental effect of mineral exploitation in Nigeria. *International Journal of Physical Sciences*, *2*(2), 33–38.

Bell, S. E., & York, R. (2010). Community economic identity: The coal industry and ideology construction in West Virginia. *Rural Sociology*, *75*(3), 111–143.

Bennett, E. A. (2012). Global social movements in global governance. *Globalizations*, *9*(6), 799–813.

Boli, J., & Thomas, G. M. (1997). World culture in the world polity: A century of international non-governmental organization. *American Sociological Review*, *62*(2), 171–190.

Carroll, G. R., & Hannan, M. T. (2000). *The demography of corporations and industries*. Princeton, NJ: Princeton University Press.

Carroll, T., & Jarvis, D. L. S. (2015). The new politics of development: Citizens, civil society, and the evolution of neoliberal development policy. *Globalizations*, *12*(3), 281–304.

Clark, B., Jorgenson, A. K., & Auerbach, D. (2012). Up in smoke: The human ecology and political economy of coal consumption. *Organization & Environment*, *25*(4), 452–469.

Conrad, C. C., & Hilchey, K. G. (2011). A review of citizen science and community-based environmental monitoring: Issues and opportunities. *Environmental Monitoring and Assessment*, *176*(1), 273–291.

Cooley, A., & Ron, J. (2002). The NGO scramble: Organizational insecurity and the political economy of transnational action. *International Security*, *27*(1), 5–39.

Crack, A. M. (2013). INGO accountability deficits: The imperatives for further reform. *Globalizations*, *10*(2), 293–308.

Eikenberry, A. M., & Kluver, J. D. (2004). The marketization of the nonprofit sector: Civil

society at risk?. *Public Administration Review*, *64*(2), 132–140.

Elberling, B. O., Søndergaard, J., Jensen, L. A., Schmidt, L. B., Hansen, B. U., Asmund, G., & Balic-Zunic, T. (2007). Arctic vegetation damage by winter-generated coal mining pollution released upon thawing. *Environmental Science & Technology*, *41*(7), 2407–2413.

Foster, J. B., Clark, B., & York, R. (2011). *The ecological rift: Capitalism's war on the earth*. New York, NY: NYU Press.

Frumkin, P. (2003). Inside venture philanthropy. *Society*, *40*(4), 7–15.

Gould, K. A., Pellow, D. N., & Schnaiberg, A. (2008). *The treadmill of production: Injustice and unsustainability in the global economy*. Boulder, CO: Paradigm Publishers.

Gould, K. A., Schnaiberg, A., & Weinberg, A. (1996). *Local environmental struggles: Citizen activism in the treadmill of production*. Cambridge: Cambridge University Press.

Green, P., Ward, T., & McConnachie, K. (2007). Logging and legality: Environmental crime, civil society, and the state. *Social Justice*, *34*(1), 94–110.

Hannan, M. T., & Freeman, J. (1977). The population ecology of organizations. *American Journal of Sociology*, *82*(5), 929–964.

Harvey, D. (2005). *A brief history of neoliberalism*. Oxford: Oxford University Press.

Jarboe, J. F. (2002). Testimony before the House Resources Committee, Subcommittee on Forests and Forest Health, 12 February. Retrieved from https://www.fbi.gov/news/testimony/the-threat-of-eco-terrorism.

Jorgenson, A. K. (2003). Consumption and environmental degradation: A cross-national analysis of the ecological footprint. *Social Problems*, *50*(3), 374–394.

Jorgenson, A. K. (2006). Unequal ecological exchange and environmental degradation: A theoretical proposition and cross-national study of deforestation, 1990–2000. *Rural Sociology*, *71*(4), 685–712.

Jorgenson, A. K., & Clark, B. (2011). Societies consuming nature: A panel study of the ecological footprints of nations, 1960–2003. *Social Science Research*, *40*(1), 226–244.

Longhofer, W., & Schofer, E. (2010). National and global origins of environmental association. *American Sociological Review*, *75*(4), 505–533.

Lynch, M. J., Michalowski, R. J., & Groves, W. B. (2000). *The new primer in radical criminology*. Monsey, NY: Criminal Justice Press.

Marx, K. (1977 [1867]). *Capital, Volume 1*. New York, NY: Vintage.

McAdam, D., McCarthy, J., & Zald, M. (2008). *Comparative perspectives on social movements*. Cambridge: Cambridge University Press.

McCormick, J. (1991). *Reclaiming paradise: The global environmental movement*. Bloomington: Indiana University Press.

Meyer, J. W., Boli, J., Thomas, G. M., & Ramirez, F. O. (1997). World society and the nation-state. *American Journal of Sociology*, *103*(1), 144–181.

Minkoff, D. (1997). Producing social capital: National social movements and civil society. *American Behavioral Scientist*, *40*(5), 606–619.

Murdie, A., & Davis, D. R. (2012). Looking in the mirror: Comparing INGO networks across issue areas. *Review of International Organizations*, *7*(2), 177–202.

Nownes, A. (2010). Density dependent dynamics in the population of transgender interest groups in the United States, 1964–2005. *Social Science Quarterly*, *91*(3), 689–703.

Nurse, A. (2013). Privatising the green police: The role of NGOs in wildlife law enforcement. *Crime,*

*Law and Social Change*, *59*(3), 305–318.

Parvu, C. A. (2016). Contestatory cosmopolitanism, neoliberal rationality and global protests. *Globalizations* Advance online publication. DOI: 10.1080/14747731.2016.1183282

Pellow, D. N., & Brulle, R. J. (2005). *Power, justice, and the environment*. Cambridge, MA: MIT Press.

Reiman, J., & Leighton, P. (2015). *The rich get richer and the poor get prison*. Abingdon, Oxon: Routledge.

Rockström, J., & Klum, M. (2015). *Big world, small planet: Abundance within planetary boundaries*. New Haven, CT: Yale University Press.

Ruggiero, V. (2013). *The crimes of the economy*. Abingdon, Oxon: Routledge.

Schnaiberg, A. (1980). *The environment: From surplus to scarcity*. Oxford: Oxford University Press.

Schofer, E., & Hironaka, A. (2005). The effects of world society on environmental protection outcomes. *Social Forces*, *84*(1), 25–47.

Stretesky, P. B., Huss, S., & Lynch, M. J. (2012). Density dependence and environmental justice organizations, 1970–2008. *Social Science Journal*, *49*(3), 343–351.

Stretesky, P., Long, M., & Lynch, M. (2013) *The treadmill of crime*. Routledge Abingdon.

Teegen, H. (2003). International NGOs as global institutions: Using social capital to impact multinational enterprises and governments. *Journal of International Management*, *9*(3), 271–285.

Udy, S. H. (1959). Bureaucracy and rationality in Weber's organization theory: An empirical study. *American Sociological Review*, *24*(6), 791–795.

United Nations. (1945). Charter of the United Nations, 24 October, 1 UNTS XVI. Retrieved from http://www.refworld.org/docid/3ae6b3930.html.

United Nations Economic and Social Council. (1996). Consultative relationship between the United Nations and non-governmental organizations. ECOSOC Resolution 1996/31, 25 July. Retrieved from http://www.un.org/esa/coordination/ngo/Resolution_1996_31/.

van Solinge, T. B. (2008). Eco-crime: The tropical timber trade. In D. Siegel & H. Nelen (Eds.), *Organized crime: Culture, markets and policies* (pp. 97–111). New York, NY: Springer.

van Solinge, T. B. (2010). Equatorial deforestation as a harmful practice and a criminological issue. In R. White (Ed.), *Global environmental harm: Criminological perspectives* (pp. 20–36). Devon: Willan.

Wackernagel, M., & Rees, W. (1998). *Our ecological footprint: Reducing human impact on the earth*. Gabriola Island, British Columbia: New Society Publishers.

Wallace, T. (2009). NGO dilemmas: Trojan horses for global neoliberalism?. *Socialist Register*, *40*, 202–219.

Waterman, P. (1998). *Globalization, social movements, and the new internationalism*. New York, NY: Mansell.

White, R. (2012). NGO engagement in environmental law enforcement: Critical reflections. *Australasian Policing*, *4*(1), 4–7.

White, R. (2013). *Crimes against nature: Environmental criminology and ecological justice*. Abingdon, Oxon: Routledge.

Willetts, P. (2010). *Non-governmental organizations in world politics: The construction of global governance*. Abingdon, Oxon: Routledge.

**Table 1.** The effects of ecological footprint, gross world product and density on INGO founding, 1950–2010; Prais–Winsten autocorrelation adjustment at lag 1 (AR1) regression results for first order differences

| Variable | Model 1<br>*b*<br>(std. error) | Model 2<br>*b*<br>(std. error) | Model 3<br>*b*<br>(std. error) | Model 4<br>*b*<br>(std. error) | Model 5<br>*b*<br>(std. error) |
|---|---|---|---|---|---|
| *Ecological Footprint* | 2.49<br>(18.58) | | | –21.00<br>(19.35) | –8.42<br>(28.62) |
| *Gross World Product* | | –0.08<br>(0.37) | | 1.17*<br>(0.52) | 0.38<br>(1.20) |
| *Density* | | | 0.61*<br>(0.16) | 0.90*<br>(0.22) | 1.08*<br>(0.33) |
| *Density Squared* | | | –0.001*<br>(0.001) | –0.002*<br>(0.001) | –0.002*<br>(0.001) |
| *Mobile Phones* | | | | | 0.24<br>(0.28) |
| *Exports* | | | | | 0.40<br>(0.69) |
| *Urban Pop.* | | | | | 2.49<br>(9.97) |
| *Education* | | | | | –2.13<br>(3.60) |
| Constant | 0.09<br>(0.42) | 0.49<br>(0.07) | –1.00<br>(0.38) | –2.71<br>(0.88) | –3.89<br>(4.10) |
| Durban-Watson | 2.12 | 2.13 | 2.01 | 2.11 | 2.11 |
| *R*-Squared | 0.01 | 0.01 | 0.21 | 0.29 | 0.37 |
| *n* [a,b] | 49 | 60 | 60 | 49[c] | 40 |
| Mean VIF | -- | -- | 4.36 | 4.70 | 6.05 |

* $p \leq 0.05$

a. Differencing variables results in a loss of one data point.

b. Data are not available since 1950 for every variable. . Thus, Model 1 examines 1961 to 2010; Models 2 and 3 examine 1950 to 2010; Model 4 examines 1961 to 2010; and Model 5 examines 1970 to 2010.

c. When *Ecological Footprint* is removed from Model 4 then $n$=60. In that instance, the coefficients and standard errors for the model without *Ecological Footprint* are as follows: *Gross World Product* = 0.48 (standard error = 0.27; $p \leq 0.10$); *Density* = 0.70 (standard error = 0.22; $p \leq 0.05$) and *Density Squared* = 0.002 (standard error = 0.001; $p \leq 0.05$). This suggests that the results in Model 4 are not due to including *Ecological Footprint* in the model.

Figure 1. Annual number of environmental enforcement INGOs founded, 1950–2010